Jan. 23, 1945. H. J. FANGER 2,368,064

HAND GRENADE GUN ADAPTER

Filed May 25, 1942

Fig. 1.

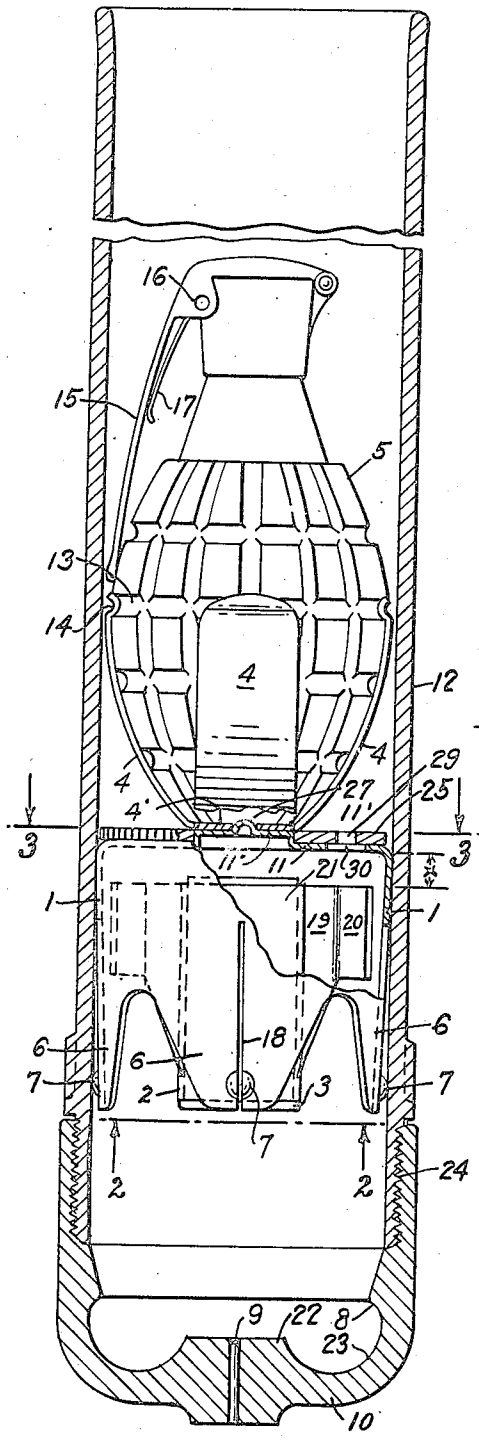


Fig. 2.

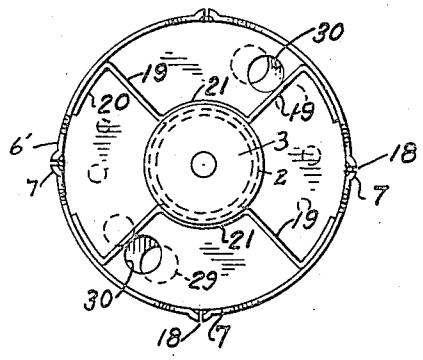


Fig. 3.

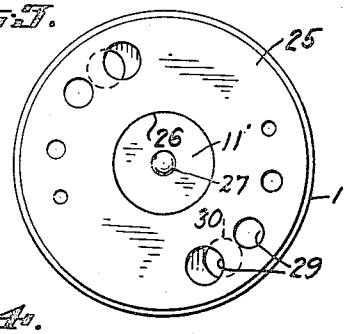
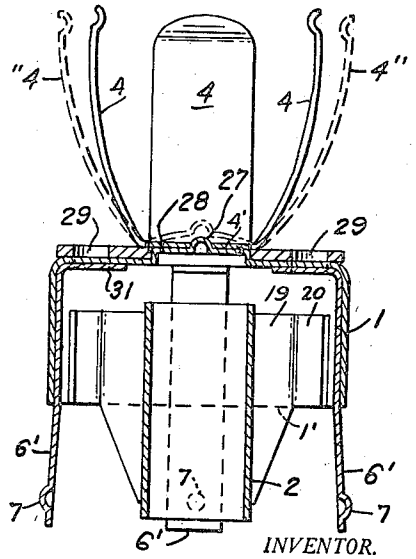


Fig. 4.



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HAND GRENADE GUN ADAPTER

Herman J. Fanger, Piedmont, Calif.

Application May 25, 1942, Serial No. 444,307

7 Claims. (Cl. 102—65.2)

This invention relates to devices or "adapters" to adapt an ordinary type of hand grenade for fitting into a mortar type of, or muzzle loading gun, so that it may be fired from the gun instead of being thrown by hand, and the objects of the invention comprise improvements in such devices whereby they will hold the expelling cartridge firmly in place over the firing pin, the adapter will effect a better seal with the wall of the gun barrel through the force of the ejecting explosion, the adapter will be automatically released from the grenade after expulsion, and a better cooperation between the adapter and firing chamber of the gun is obtained.

Other features and advantages of the invention will appear in the following description and accompanying drawing.

In the drawing—

Fig. 1 is a substantially full size longitudinal cross section taken through a gun barrel with my special adapter with grenade and ejection cartridge within the barrel as if just dropped therein and on the way down to the bottom or firing chamber.

Fig. 2 is a bottom view of the adapter as seen from the line 2—2 of Fig. 1.

Fig. 3 is a plan view of the adapter as seen from the line 3—3 of Fig. 1.

Fig. 4 is a vertical cross section of the adapter but showing a modification in the length of skirt and spring retaining detents which lock the adapter in place in the firing chamber.

Briefly described the invention comprises an inverted sheet metal cup 1 with a central downwardly extending tube 2 to hold the expelling cartridge 3, and an upwardly extending set of spring arms 4 to receive and hold the grenade 5, the lower rim of the inverted cup is formed with extending spring detents or legs 6 with engaging lugs 7 or humps which engage under an annular shoulder 8 formed within the lower end of the firing chamber of the gun to lock the adapter in place with its cartridge cap aligned over the firing pin 9 of the gun 10. The construction of the adapter is such that when the cartridge is fired to eject the adapted with its grenade, the shock of the exploding cartridge will warp the central portion 11' of the bottom 11 of the inverted sheet metal cup 1 and thereby force the spring arms 4 outwardly to tend to release the grenade as soon as the adapter is out of the barrel 12 of the gun, so that the grenade will be free to travel alone without the adapter.

In the drawing the grenade 5 is of ordinary well known construction with a vertically and horizontally scored or groove weakened body and into one of the horizontal grooves 13 of which the inwardly bent lips 14 of arms 4 spring to retain the grenade on the adapter. But before inserting the grenade and adapter into the open ended barrel of the gun, or preferably after the handle or firing lever 15 is partially within the gun barrel, the grenade safety pin is withdrawn from hole 16 so that when the gun is fired and the grenade leaves the gun its lever will fly out under the force of its spring 17 and start the grenade fuse in the usual way.

The spring legs 6 of the cup may be integral with the cup wall and are preferably vertically split as at 18 to make them more resilient, and are provided with outwardly projecting rounded buttons or lugs 7 which will lock under the special firing chamber shoulder 8 yet will spring inwardly again to release the adapter in response to a superior force applied to remove the adapter outwardly either as the force of the exploding cartridge 3 or by jouncing the gun in inverted position to dislodge the adapter with its grenade.

The cartridge 3 is an ordinary shotgun shell, preferably with the usual powder charge but without shot, tho it will work even with shot in it, and the tube 2 in which the cartridge is held is centrally positioned and rigidly braced by several spider arms 19 flanged over at their ends as at 20 and welded to the cup wall and formed with confronting curved portions 21 embracing the tube 2 and welded or otherwise secured thereto.

The spider arms are spaced a distance X below the bottom of the cup to provide a free annular portion of the cup wall which will bulge outward by the pressure of exploding cartridge gases to instantly effect a sealing fit within the gun barrel before any appreciable leakage of pressure can take place—it being understood that originally the cup must be a fairly easy sliding fit in the gun barrel in order to permit its easy insertion when loading the gun.

When the assembly is at the bottom of the barrel the cartridge head seats upon a central hub or base 22 and the adjacent bottom of the firing chamber is curved as at 23 to form an annular concave ring which deflects the force of the explosion upwardly and convergingly into the inverted adapter cup.

In regard to the inwardly projecting locking shoulder 8 this preferably extends slightly within the diameter of the bore of the gun barrel 12 as shown. The barrel 12 is shown threaded to the firing chamber portion 10 of the gun as at

24, but may be integral. The mechanism for operating the firing pin 9 is not shown, nor is the gun mounting, as apart from the cooperating formation of the firing chamber with its adapter retaining shoulder 8, it has no bearing on the present invention.

On the upper end 11 of the cup is a revolvable ring or disk 25 centrally bored as at 26 and centered over a flat boss 11' struck up from the cup bottom or end wall 11, and which flat boss is further struck up with a centering tit 27 which enters a centering opening in the center of the plate portion 4' which joins the arms 4 and from which they radiate. This plate portion 4' of the arms is spot welded in a ring at 28 about the centering tit 27 as indicated in Fig. 4, and as the metal is somewhat thinner in portion 11' it will bulge slightly upward upon firing the cartridge, and force the arms 4 outward tending to release the grenade, as dotted at 4'' in Fig. 4, but which release takes effect after the grenade and adapter have left the gun, and the arms are free of confinement by the gun barrel.

Disk 25 is provided with two arcuate rows of varying size holes 29 which may variously be brought in alignment with a couple of large holes 30 in the end wall of the cup, by revolving the disk, or the latter hole may be entirely closed by further revolving of the disk, all so as to form a controlled pressure leakage for the cartridge explosion gases, and thereby determine the trajectory or range of the grenade at a given angle of the gun.

Instead of forming the detent legs 6 integral with the sides of the cup, the cup wall 1 may be shorter and terminate straight across as shown at 1' of Fig. 4 and the spring legs may be slightly arcuate strips 6' of metal extending freely up inside the cup and bent over at their upper ends as at 31 and suitably secured to the cup end wall or bottom 11 as by spot welding.

From the above description the operation of the invention will be clear and require no further elucidation, for it is manifest that a soldier need but press a grenade into the group of adapter arms 4, insert a shot gun cartridge into the tube 2, pull out the grenade safety pin while holding its firing lever or handle down, drop the assemblage down the barrel of the gun to have it lock in place by means of the spring retainers 7 cooperating with annular shoulder 8 of the firing chamber, and pull the trigger.

Having thus described my invention and the manner of its use what I claim in the present application is:

1. A gun adapter for a grenade comprising a cylindrical sheet metal cup of a size to be slidable within the bore of the gun, resilient means for frictionally holding a grenade at the closed end of the cup substantially aligned with the cup, means at the inside of the cup for holding a cartridge with its percussion cap directed outwardly, and a plurality of resilient extensions around the edge of the cup provided with laterally projecting portions arranged to frictionally engage complementary formed means on the inner wall of the firing chamber of the gun, when the adapter is seated in firing position, the arrangement being such that the resilient extensions will spring inwardly to release the frictional engagement of the parts when the gun is fired.

2. A gun adapter for a grenade comprising a cylindrical sheet metal cup of a size exteriorly to be a slidable fit within the bore of the gun, resilient means for frictionally holding a grenade at the closed end of the cup substantially aligned with the cup, means at the inside of the cup for holding a cartridge with its percussion cap directed outwardly, and a plurality of resilient extensions around the edge of the cup arranged to frictionally engage the inner wall of the firing chamber of the gun, the means for holding the cartridge including a tubular member of a size to receive the cartridge axially disposed within the cup in a manner to provide a substantial space between the inner end of the cartridge and the bottom of the cup so that the explosion gases of the cartridge may freely act upon the inner exposed wall of the sheet metal cup adjacent its bottom to expand the same and seal the cup against the bore of the gun, and spider arms bracing said tube to the inner wall of the cup, said spider arms spaced outward from the bottom of the cup to maintain the remainder of the wall of the sheet metal cup free and clear for expanding.

3. A gun adapter for a grenade comprising a cylindrical sheet metal cup of a size exteriorly to be a slidable fit within the bore of the gun, resilient means for frictionally holding a grenade at the closed end of the cup substantially aligned with the cup, means at the inside of the cup for holding a cartridge with its percussion cap directed outwardly, and a plurality of resilient extensions around the edge of the cup arranged to frictionally engage the inner wall of the firing chamber of the gun, said resilient extensions around the edge of the cup being separate strips of metal passing into the cup adjacent the inner surface of the wall of the cup and secured to the cup at their inner ends.

4. A gun adapter for a grenade comprising a cylindrical sheet metal cup of a size to slide within the bore of a gun, means for holding a grenade at the closed end of the cup, means at the inside of the cup for holding a cartridge with its percussion cap directed outwardly, and bendable means associated with the outer end of the cup arranged and adapted to be bent by the explosion gas pressure of the cartridge when the gun is fired to release said means for holding a grenade.

5. A gun adapted for a grenade comprising an inverted cylindrical sheet metal cup of a size to slide within the bore of a gun, a plurality of spring arms projecting from the outer bottom of the cup of a length to extend a distance over the outer wall of a grenade and arranged to embrace and hold the grenade at the outer side of the closed end of the cup, means at the inside of the cup for holding a cartridge with its percussion cap directed downwardly, and means associated with the closed end of the cup arranged and adapted to be acted upon by the explosion gas pressure of the cartridge when the gun is fired to spread and release said arms for holding a grenade.

6. A gun adapter for a grenade comprising a cylindrical sheet metal cup of a size exteriorly to be a slidable fit within the bore of the gun, resilient means for frictionally holding a grenade at the closed end of the cup substantially aligned with the cup, means at the inside of the cup for holding a cartridge with its percussion cap directed outwardly, and a plurality of resilient extensions around the edge of the cup arranged to frictionally engage the inner wall of the firing chamber of the gun, a circular shutter revolvably arranged on the closed end of the cup provided with through openings adapted to coincide more

or less with an opening in the end of the cup to control by-passing of explosion gases.

7. A gun adapter for a grenade comprising a cylindrical sheet metal cup of a size exteriorly to be a slidable fit within the bore of the gun, resilient means for frictionally holding a grenade at the closed end of the cup substantially aligned with the cup, means at the inside of the cup for holding a cartridge with its percussion cap directed outwardly, and a plurality of resilient extensions around the edge of the cup arranged to frictionally engage the inner wall of the firing chamber of the gun, said resilient extensions being each split vertically and formed with an outwardly extending hump adapted to engage in a complementarily formed recess in the firing chamber of the gun.

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